

FIRST BREEDING RECORD OF THE COLLARED FALCONET *MICROHIERAX CAERULESCENS* FOR THE INDIAN SUBCONTINENT IN CORBETT NATIONAL PARK, UTTAR PRADESH¹

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(With one text-figure)

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Little is known about the collared falconet *Microhierax caerulescens* which is distributed in India throughout the lower Himalayan foothills from Garhwal eastwards to Assam, Northeastern hill states and Arunachal Pradesh usually upto 900 m, but has been recorded as high as 2000 m. Previously recorded from the Terai, where most of its former habitat has now shrunk or disappeared, it is a deciduous to moist-deciduous and evergreen forest dwelling species, most often observed hunting in man-made clearings, natural open spaces and forest margins. It commonly forages in degraded secondary deciduous and semi-evergreen biotope. Breeding within Indian limits has not been previously recorded for this comparatively common bird. The species appears to have been overlooked due to its small size (often mistaken for a passerine), its tendency for perching within forest (when not foraging), crepuscular habits and roosting and breeding within relatively high nest-holes of barbets, which to some degree may account for low detectability during the breeding season. However, the species is relatively conspicuous during courtship when frequent calls and associated self-evident demonstrative activity by a pair draws the observer's attention to the birds. Scant breeding data, however, is available on the extralimital Burmese race *M.c. burmanicus* (Baker, 1935; Ali and Ripley, 1978). This paper presents preliminary observations on courtship and incubation of this little studied raptor.

STUDY AREA

The study was carried out in Corbett National Park which lies between the two sub-Himalayan districts of Pauri and Nainital in Uttar Pradesh (29° 31' - 29° 35' N. lat., 70° 41' E. long.). It is situated in the lower central Himalayan Sivalik foothills (Fig. 1) which form part of the Bhabar tract. The central portion of the Park is located partly along a valley, between the lesser Himalaya to the north and the Sivalik ranges to the south. The middle reaches of the Ramganga river flow through most of the Park along the Patli Dun. About 10% of the grassland area has been submerged by the damming of the Ramganga river at Kalagarh, forming a large reservoir in the western corner of the Park, covering an area of about 80 sq. km, of which 42 sq. km is within the Park. A number of *sots* (springs) emerge from the numerous ridges which comprise the secondary source of water in the Park, after the Ramganga river. The altitude varies from 300 to 1040 m. The Park is contiguous with extensive reserved forest to the west and the east which probably facilitates lateral avifaunal movement. Further, its location at the foot of the lower Himalaya acts as a meeting ground for avian species of high altitude and plains, which account for its species richness and diversity.

Three main vegetation zones exist. The forest, grassland (locally called *chaur*) and the Ramganga riverine valley. Though 110 species of trees have been recorded, the dominant tree species is sal *Shorea robusta* forming almost pure forest stands. There are six major flat grasslands holding

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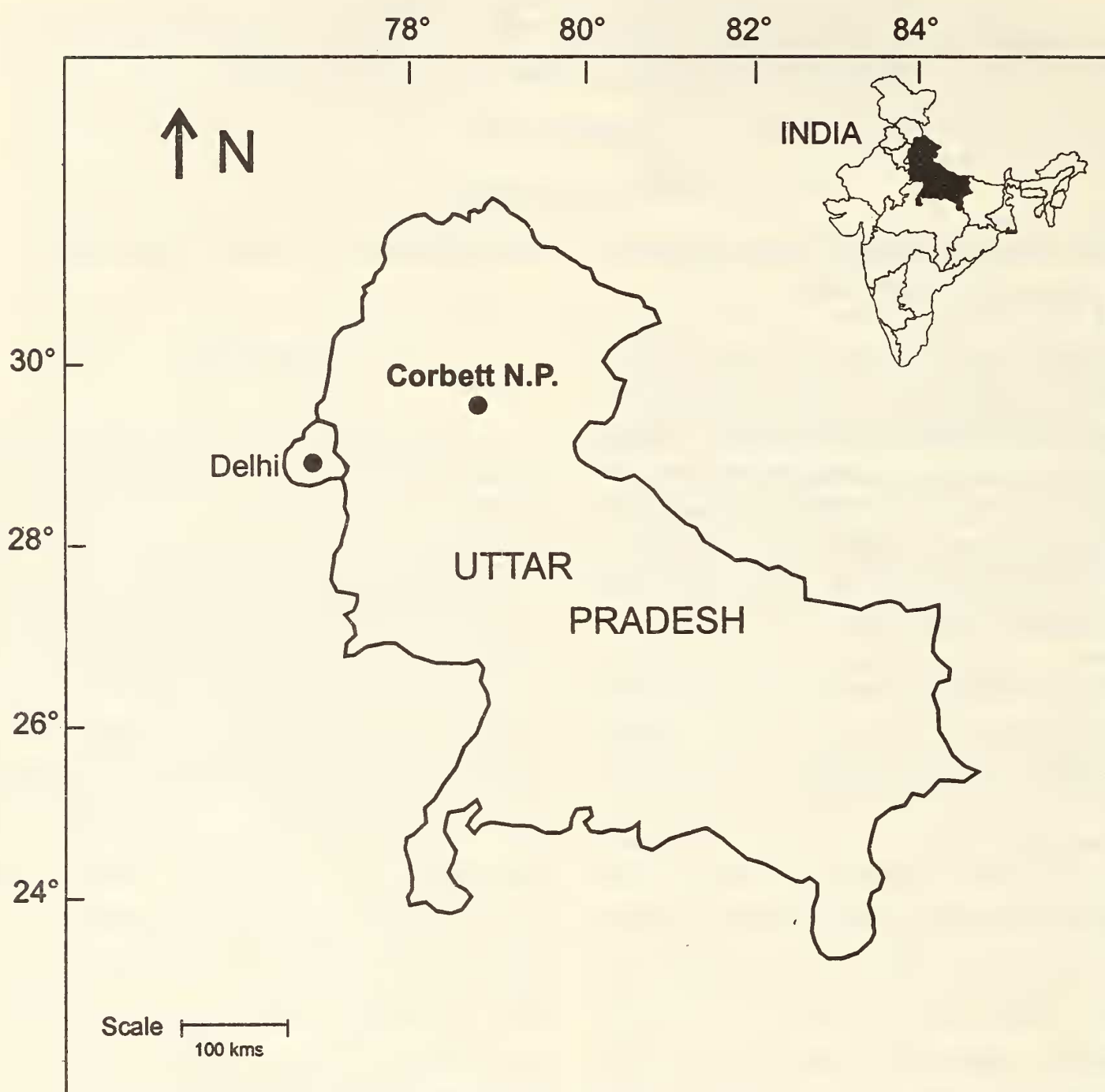


Fig. 1. Map of Uttar Pradesh and location of Corbett National Park

thirty-seven species of grasses. The largest grasslands are around Dhikala and Khinnanauli. The main forest types are a mixture of deciduous, tropical and subtropical. Sal dominates the moist deciduous biotope in the northern region of the Park. The biotope in the southern half of the Park, especially along the Sivalik hills, is dry deciduous. These three zones account for the genetic richness (both floral and faunal) and biogeographic diversity of the area. The river bed, the high banks and islands are colonised by sheeshum *Dalbergia sissoo*. *Lantana camara* is spreading unchecked,

and is likely to adversely affect the native vegetation by suppressing the regeneration of sal and other herbaceous species. *Cannabis sativa* (bhang) grows profusely in parts of the grassland and in open areas. Bamboo clumps occur frequently in the Park on the higher hill slopes. Chir *Pinus roxburghii* are confined in small numbers on some of the highest ridges, eg., the Sultan watch tower. A nest was located in moderately dense sal forest, 300 m from the grassland. The leaf fall and shedding of dried sal flowers was in progress at the outset of the courtship period.

METHODS

A nest was located while on elephant back. Shrill piercing calls drew my attention to a branch 4 m above me where a pair of falconets was mating. The male flew, plucked off a dried sal leaf and entered a disused barbets' nest-hole. Periodic observations through a spotting scope were made from a safe distance along the tracking line at the edge of which the nest-tree stood. Once incubation commenced, sustained close-up observations were made from an inverted cot, locally procured, secured between two trees, above the reach of wild elephants. The nest was under observation from 16th April to 15th May, 1993, for a total of 38 hrs.

RESULTS

The female collared falconet was larger, with the diagnostic red throat patch and belly deeper than the male whose plumage was overall lighter. An unused barbet's nest-hole (either the large green *Megalaima zeylanica* or lineated *M. lineata*) was occupied for nesting. The larger, dominant female influenced the male's activities during incubation. The characteristic, constant vertical flicking of the tail facilitated location of the bird, given its small size. Vantage perches on bare branches around the nest were utilized during the day for food transfers, feeding, and by the male, for perching.

Nest and Nest-tree specifications

A disused barbet's nest 18 m high on a sal tree (three quarters up the nest-tree below the canopy) was used for nesting. The nest-hole faced northwest and was on the underside of a 45° vertically angled, outward sloping bare branch (perhaps as protection against adverse weather conditions). The rim formed an almost complete circle, the vertical and horizontal diameters being 6.5 cm and 6 cm respectively. The depth of the entrance was 29.5 cm. Two nests from Burma

described by Baker (1935) were varyingly 7 m to 30 m high on different tree species, usually on the underside of a decayed or bare branch.

The nest-tree was well over 20 m high with the girth at breast height being 165 cm. The nest-tree's leaf fall was complete, the tree itself bare while other sal trees in the vicinity were all in new leaf. The nest-tree was situated in moderately dense sal forest (in forestry terms 0.5 to 0.6) at the edge of the tracking line, 300 m from Thandi Sadak road, the dividing line between the *chaur* and the forest. The undergrowth consisted mainly of *Lantana* sp., curry leaf *Murraya coenigii*, rohini *Mallotus philipensis* and sal leaf litter.

Courtship and Mating

Courtship and mating were in progress when the pair were located on 16th April, 1993. Prior to mating, the male performed an extended courtship ritual, accompanied by frequent shrill and piercing whistles. The female mostly remained perched on a bare horizontal branch, while the male flew intermittent sorties of a short duration, returning frequently to perch excitedly alongside the female before flying off. On these sorties, the male would often pluck dried sal leaves with the feet in active flight and deposit them in the nest-hole (n=4). The larger leaves frequently got wedged at the nest-hole entrance and were dropped. Sometimes he would perch alongside the female with the leaf (an offering?) before depositing it in the nest. After each sortie, when the male alighted alongside the female, the pair greeted each other with calls, the male additionally attracting the female's attention by frequently spreading his wings. The pair would perch close, indulging in much bill touching and cheek preening initiated mainly by the male, occasionally by the female. Clumping and extended bouts of allopreening appears to be common among the sociable *Microhierax* falconets (Sparks 1965, Kemp and Crowe 1994). The depositing of leaves, bill touching and allopreening appear significant in maintaining the pair

bond. During the late courtship period the pair would occasionally deposit leaves in the nest-hole without any ritual.

Mating usually followed the courtship display and continued well into the incubation period. Mating was more frequent throughout courtship than during the early incubation period. Once mating was observed 20 m from the nest, but mostly it occurred within a few metres of the nest.

During incubation no extended courtship ritual preceded mating. Either one of the incubating adults, generally the female, would fly from the nest-hole to where its mate was perched. The pair would either briefly touch bills with much chattering or immediately commence copulation, which was accompanied by a rapid high-pitched chatter. Duration of copulation was 4 to 8 seconds ($n=9$), the male maintaining balance with much wing-flapping. Once the male mounted the female for almost a minute, though actual mating lasted only a few seconds. Copulation was mostly observed during the mornings of both the courtship and early incubation periods.

Incubation

A total of about 33 observation hours were spent monitoring incubation between 30th April to 15th May, 1993. The attentiveness of the female at the nest increased markedly after 28th/29th April. Prior to these dates, incubation was sporadic and its duration gradually increased till the complete clutch was laid. Tight incubation commenced on 30th April. Both adults incubated, the female for longer periods 82%, male 12%, while the eggs were unattended for 6% of the observation period. The longest incubation stint by the male was, an hour. Once during the early incubation period, after steady incubation had commenced, the nest was unattended for 36 mins from 0645 to 0721 hrs. During incubation dried sal leaves were occasionally deposited in the nest-hole by the pair

(male $n=3$, female $n=1$). This activity was performed primarily by the male for both courtship and early incubation periods. When both adults were observed to be in the nest-hole ($n=7$, usually during the afternoon), the female invariably incubated, with the male settled just within the nest-hole entrance (for durations ranging from 2 mins to 2.38 hrs). All sounds (whether human, animal or bird) were immediately investigated by peering out of the nest-hole, or flying momentarily to a nearby perch to assess the potential danger, before returning to the nest.

By the fourth or fifth day of incubation, an increasing patch of droppings on the lower rim of the nest-hole, on the branch below, and favourite perches in the nest-vicinity were indicative of an active nest. During the afternoon hours, the male would often settle just within the nest-hole entrance, instead of the usual perches used during the mornings and evenings. Once the male remained mostly within the nest-hole entrance from 1500 to 1900 hrs except for two short bouts (outside the nest) totalling 72 mins. The female initiated changeovers by flying to the male, chattering constantly. She sidled up to him, and after brief bill touching, nudging and finally shrill vocal urging, the male would be induced to commence incubation. The pair suddenly abandoned the nest on 17th May, (after 19 days of incubation) and vanished thereafter. Mynas and parakeets repeatedly investigated the deserted nest-hole, but did not occupy it.

Calls

In greeting or prior to mating, the pair would chatter in unison. Frequent, shrill, piercing whistles accompanied the courtship ritual and mating. A typical, thin, rapid high-pitched chatter (in unison) *Che-che-che-che-che* was associated with mating, while similar calls were delivered singly in slower, shorter, staccato whistles. Many of the male's activities (eg. relieving the incubating female, hunting, prey visits, nest

defence) were initiated through calls by the dominant female. She vocalised more frequently than the male (89% versus 11% by the male), and her calls were more high pitched.

High pitched, quickly repeated calls (suggesting urgency?) that subsequently lapsed into single note calls were mostly used to summon the male. Persistent calling by the female resulted in the male sometimes flying to the nest-hole perch with prey. She would greet him with a shrill *twe, twe, twe...* in rapid succession, the call rising to a crescendo, then varyingly repeated. The incubating female vocalised solely from the nest-hole entrance, never from within the incubation chamber.

Roosting

The pair roosted together in the nest-hole generally by 1920 hrs about 30 mins after sunset or occasionally earlier. The female always incubated at night, while the male roosted just within the nest-hole entrance.

Interspecific Conflicts

The competition for nest-holes by other species was severe during the incubation period, and even a momentary absence from the nest often invited investigation from other hole-nesters. The pair had to repeatedly repel attempts mostly by parakeets, mainly rose-ringed *Psittacula krameri*, red-breasted *Psittacula alexandri* and common mynas *Acridotheres tristis* from investigating their nest-hole. The male was once displaced from his perch by an Indian tree-pie *Dendrocitta vagabunda* and twice engaged in an extended dogfight with a black drongo *Dicrurus adsimilis*. The female occasionally broke off incubation to drive away parakeets and mynas.

Food and Hunting

Only three prey visits to the nest were observed during the study period. One fresh and

two cached prey items were brought to the nest solely by the male, relieving the female (once for upto 23 mins) at incubation while she fed away from the nest. Prey was not taken into the nest-hole, but eaten mainly on the nest-hole branch or nearby perches.

Though the collared falconet takes a variety of prey, mainly insects and lizards (Ali and Ripley 1978, Baker 1935, Brown and Amadon 1968), only birds were observed being brought to the nest. Prey was cached on the nest-hole branch and on other frequently used bare horizontal branches in the nest vicinity. The male mostly hunted during the late courtship stage (though sometimes with the female), and solely during the incubation stage. The male foraged in the forest around the nest and in the nearby *chaur* upto at least 200 - 300 m from the nest.

DISCUSSION

The sudden termination of incubation and disappearance of the pair remains a mystery. In all likelihood, the eggs may have been addled and the pair lost interest. Predation too cannot be ruled out.

Baker (1935) collected a full clutch of eggs from a nest on 14th April from Burma, which perhaps indicates a later nesting period in the Central Himalayan foothills relative to that in Burma, or late nesting by the pair under observation. Although the nest was not physically checked to avoid disturbance, it is likely that the clutch was completed at about the time the female's attentiveness at the nest increased. The full clutch was, therefore, incubated for about 19 days before being abandoned.

Clumping and allopreening is apparently not restricted to the breeding period of the species, as observed by Sparks (1965) in a non-breeding captive pair.

It has been suggested that clumping and allopreening indicate the social nature of the species and the genus as a whole, and may be linked with aggression and autopreening

behaviour, acting probably to reduce aggressive behaviour and facilitate clumping, and that the species may even breed cooperatively (Sparks 1965, Kemp and Crowe 1994). In a subsequent study, Kemp and Van Zyl (in prep.) report co-operative breeding in the race *burmanicus*, having observed two almost fledged young attended to by five adults, and fed by at least three — two possible males and the breeding female. I observed no signs of aggression, the pair under observation nested in isolation from congeners. One explanation could be that at Corbett the species has a naturally low breeding population density or it could be a straggling breeder. The species is evidently social, moving about in small parties in the non-breeding season, and frequently observed at Corbett between October and February.

The information presented here adds much to our basic knowledge of the biology of the species, though more information is required on the breeding biology and ecology of the species, the full extent of the breeding period, duration and commencement of courtship, incubation and nestling periods and detailed role of sexes during the breeding period. Prey and prey preferences throughout the breeding period, preferably from

different areas should be studied as the limited hunting and prey data suggests that when breeding, the species supplements its normal prey (mainly insects but also lizards) with larger prey viz. small birds. Nestling success and average number of young reared, whether co-operative breeding does occur and to what extent, habitat requirements and territory; hunting success and dependency period of young are all areas for further investigation.

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